**Test of DSSAT-ORYZA2000 linkage** November 16, 2011

ORYZA2000 Filenames: IR72wsn3.t92

From files HD297.exp, HD297\_A11.exp and HD297\_A22.exp.

DSSAT File name: IRCH0301.RIX

**HD297.EXP**

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\* EXPERIMENTAL DATA FILE \*

\* For SCENARIO ANALYSIS

\* \*

\* File name : HD297exp.DAT \*

\* Crop : Oryza sativa cv. Han Dao 297 \*

\* Fertilizer : 225 kg N/ha,

\* Irrigation : Full irrigation throughout growth period \*

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\*--------------------------------------------------------------------\*

\* 1. Selection of modes of running \*

\*--------------------------------------------------------------------\*

\*-- RICETYPE is to select lowland rice or aerobic/upland rice

RICETYPE = 'LOWLAND' ! Lowland rice

\*RICETYPE = 'AEROBIC' ! Upland or aerobic rice

\*-- RUNMODE: mode of running ORYZA

RUNMODE = 'EXPERIMENT' ! ORYZA simulates particular experiment

\*RUNMODE ='EXPLORATION' ! ORYZA used for exploration

\*-- PRODENV = Production situation setting

\*PRODENV = 'POTENTIAL' ! Potential production

PRODENV = 'WATER BALANCE' ! Production may be water-limited

\*DSSAT: ISWWAT = ‘Y’

\*-- WATBAL is choice of Water Balance

\* needs only be given when PRODENV = 'WATER BALANCE'

WATBAL = 'PADDY' ! PADDY water balance (for lowland soils)

\*WATBAL = 'SAHEL' ! SAHEL water balance (for freely draining upland soils)

\*WATBAL = 'SAWAH' ! SAWAH water balance (for lowland or upland soils)

\*-- NITROENV = Nitrogen production situation setting

\*NITROENV = 'POTENTIAL' ! Potential production

NITROENV = 'NITROGEN BALANCE' ! Production may be nitrogen-limited

\*DSSAT: ISWNIT = ‘Y’

\*-- ETMOD is method for evapotranspiration calculation:

ETMOD = 'PENMAN' ! Penman-based (Van Kraalingen & Stol,1996)

\*ETMOD = 'PRIESTLY TAYLOR' ! Priestly-Taylor (")

\*ETMOD = 'MAKKINK' ! Makkink (Van Kraalingen & Stol, 1996)

\*DSSAT: EVAPO = ‘F’

\*--------------------------------------------------------------------\*

\* 2. Timer data for simulation \*

\*--------------------------------------------------------------------\*

IYEAR = 2003 ! Start year of simulation (year)

STTIME = 136. ! Start time (day number)

FINTIM = 1000. ! Finish time (days after start)

DELT = 1. ! Time step (day)

\*DSSAT: YRSIM = 03136

\*--------------------------------------------------------------------\*

\* 3. Weather station and climatic data for simulation \*

\*--------------------------------------------------------------------\*

WTRDIR = 'D:\Projects\VirtualCrop\RunExamples\China\_Aerobic\' ! Directory of weather data

CNTR = 'CHINA' ! Country code

ISTN = 3 ! Station code

ANGA = 0.29 ! Angstrom A parameter

ANGB = 0.45 ! Angstrom B parameter

TMCTB = 0., 0., ! Table for temperature increase

366., 0. ! Climatic Change studies

FAOF = 1. ! Multipl. factor for pot. evapotranspiration (FAO)

! Value Murty & Tuong

TMPSB = 0. ! Temperature increase in seed-bed due to cover:

! Zero when no cover over seed-bed; 9.5 with seed-bed

\*--------------------------------------------------------------------\*

\* 4. Establishment data

\*--------------------------------------------------------------------\*

\*-- ESTAB is method of establishment: 'TRANSPLANT' or 'DIRECT-SEED'

\*ESTAB='TRANSPLANT'

ESTAB='DIRECT-SEED'

\*DSSAT: PLME = ‘S’

\* Aerobic rice: sowing date 16 May; 50% emergence 24 May

EMD = 141 ! Day of emergence (either direct, or in seed-bed)

EMYR = 2003 ! Year of emergence

SBDUR = 19 ! Seed-bed duration (days between sowing and transplanting) NOT USED HERE

ORYZA2000 did not simulation the growth before emergence, so the input file only have EMD but no parameter for sowing date. There is the difference in the definition of EMD, for direct-seeding, the date of the first plant was observed at the surface is the EMD presented in the input file. The May 24 is the 50% emergence.

Direct seed date: May 16 (DOY 136)

EMD = May 21 (DOY 141)

50% emergence = May 24 (DOY 144)

\*DSSAT: PDATE = 03141 !this is the start date for ORYZA simulation

EDATE = 03144

\*--------------------------------------------------------------------\*

\* 5. Management parameters \*

\*--------------------------------------------------------------------\*

\* rows 30 cm seeding rate: 150 kg/ha (0.02 g per grain)

NPLH = 1. ! Number of plants per hill

NH = 1. ! Number of hills/m2 (13 x 27 cm)

NPLSB = 350. ! Number of plants in seed-bed (???)

NPLDS = 360. ! Number of plants/m2 direct-seeded, according to wheat

! 120kg/ha should be smaller than 210!!!

\*DSSAT: PPOP = 360. plants / m2 in seed bed

\* PPOE = 360.

\*-- Initial data at emergence, for either direct-seeding or seed-bed

\* Standard data used.

LAPE = 0.00005 ! Initial leaf area per plant (m2 plant-1) (according to wheat)

\*LAPE = 0.0001

DVSI = 0.0 ! Initial development stage

WLVGI = 0.0 ! Initial leaf weight

WSTI = 0.0 ! Initial stem weight

WRTI = 0.0 ! Initial stem weight

WSOI = 0.0 ! Initial weight storage organs

ZRTI = 0.0001 ! Initial root depth (m)

\*-- Re-initialization at transplanting (standard data used)

ZRTTR = 0.05 ! Root depth at transplanting (m)

\*---------------------------------------------------------------\*

\* 6. Irrigation switch:

\* Need only to be filled-in when PRODENV = 'WATER BALANCE'

\*---------------------------------------------------------------\*

DVSIMAX = 2.0 ! Development stage after which no more irrigation is applied

\* NEW SETTING, BY TAOLI, 21 MAY 2010

\* The determination for switch critical

ICOMBA = 2 !1: Use Julian day; 2: Use DVS and 3: Use mixture of DVS and Julian day,

\* but the Julian day is not allowed to be smaller than 2

\* Combining irrigation management methods table IRMTAB, it must have at least two lines,

\* X (Julian day or DVS or DVS+Julian, present the switching day), Y (methods in real number)

IRMTAB = 0.,1.0,

2.0,1.0

\*\* Select from the following options:

\*SWITIR = 0 ! No irrigation; rainfed

\*SWITIR = 1 ! Irrigation supplied as input data

\*SWITIR = 2 ! Irrigation at minimum standing soil water depth

\*SWITIR = 3 ! Irrigation at minimum soil water potential

\*SWITIR = 4 ! Irrigation at minimum soil water content

\*SWITIR = 5 ! Irrigation at X days after disapp. standing water

\*SWITIR = 6 ! Irrigation at minimum soil water potential in defined periods only

\*Where do we read the value of SWITR? I don’t see any values set in this file.

      For all three experiments, the SWITR is 1 – ‘irrigation supplied as input data’, which was set in the parameter ‘IRMTAB’.

\*\* If SWITIR = 1, supply irrigation table, amount of irrigation

\*\* (y in mm) for a given calendar \* day (x), used if

RIRRIT = 1., 0.,

170., 0.,

171., 40.,

184., 0.,

185., 60.,

186., 0.,

198., 0.,

199., 20.,

201., 0.,

221., 0.,

222., 20.,

\* 223., 0.,

228., 0.,

229., 40.,

230., 0.,

253., 0.,

254., 60.,

255., 0.,

365., 0.

\*\* If SWITIR = 2, supply amount of irrigation IRRI (mm)

IRRI2 = 20. ! Irrigation gift (mm)

WL0MIN = 5. ! Minimum standing water depth (mm)

\*\* IF SWITIR =3:

\*\*\*1) supply amount of irrigation IRRI3 (mm)

\*\*\*2) supply minimum soil water potential KPAMIN (KPa)

\*\*\*3) Supply soil layer for which KPAMIN aplied, SLMIN3

IRRI3 = 50. !IT MUST BE REAL DATA

KPAMIN = 10. !IT MUST BE REAL DATA

SLMIN3 = 2 !IT MUST BE INTEGER DATA

\*\* IF SWITIR = 4:

\*\*\*1) supply amount of irrigation IRRI4 (mm)

\*\*\*2) supply minimum soil water conten WCAMIN (-)

\*\*\*3) Supply soil layer for which KPAMIN aplied, SLMIN4

IRRI4 = 75. !IT MUST BE REAL DATA

WCMIN = 0.3662 !IT MUST BE REAL DATA

SLMIN4 =2 !IT MUST BE INTEGER DATA

\*\* IF SWITIR = 5:

\*\*\*1) supply amount of irrigation IRRI5 (mm)

\*\*\*2) supply number of days after disappearence of standing water (WL0DAY) at which irrigation water is applied

IRRI5 = 75. !IT MUST BE REAL DATA

WL0DAY = 5 ! number of days after disappearence of (-) INTEGER!!

\* IF SWITIR = 6:

\*\*\*1) supply amount of irrigation IRRI6 (mm)

\*\*\*2) Supply soil layer for which KPAMIN aplied, SLMIN6

\*\*\*3) period table as "start DVS' 'finish DVS' 'KPAMIN during period'

\* Irrigation will be applied in the periods between 'start DVs' to 'end DVS'

\* and only when the soil water tension in layer SLMIN is above KPAMIN in that period

\* Note: at maximum 5 stages can de defined (no more than 15 data in table)!

IRRI6 = 50. !IT MUST BE REAL DATA

SLMIN6 = 3 !IT MUST BE INTEGER DATA

ISTAGET = 0.00, 0.20, 5.,

0.65, 0.80, 50.,

1.00, 1.20, 5.,

1.50, 1.60, 50.,

1.70, 1.80, 5.

\*--------------------------------------------------------------------\*

\* 7. Nitrogen parameters \*

\*--------------------------------------------------------------------\*

NUTRIENT = 'GENERAL SOM' !USE GENERAL SOIL ORGANIC C AND N MODULE TO HANDLE THE NUTRIENT CHANGES

\*NUTRIENT = 'APSIM SOILN' !USE APSIM SOIL C AND N MODULE TO HANDLE THE NUTRIENT CHANGES, IT CONSISTED

!BY SOILN, POND AND SURFACEOM MODULES

\* Table of recovery fraction of Nitrogen in the soil (-) second column

\* versus development stage (DVS) (first column) STANDARD VALUE

RECNIT =

0.0, 0.30,

0.2, 0.35,

0.4, 0.50,

0.8, 0.75,

1.0, 0.75,

2.5, 0.75

\* NO DATA ON SOILSP: THIS 0.8 IS FOR IRRI CONDITIONS IN THE DS......

SOILSP = 0.8 ! Soil N mineralization rate (kg N/ha/d)

\* Table of fertilizer rate (kg N/ha) (second column) versus days after emergence

\* in the seed-bed (!) (first column)

FERTIL = 0.0,75.0,

56.0,75.0,

76.0,75.0

Need fertilizer type and application method – assuming urea

\*--------------------------------------------------------------------\*

\* 8. Measured data for model calibration and comparison \*

\* And option to force measured LAI during simulation \*

\* (instead of using simulated values) \*

\*--------------------------------------------------------------------\*

\* Observed phenology: only required if program DRATES is run!!

\* Observed phenology: only required if program DRATES is run!!

IDOYTR = 0 ! Day of transplanting (give 0 if direct-seeded)

IYRTR = 0 ! Year of transplanting (give 0 if direct-seeded)

IDOYPI = 205 ! Day of panicle initiation (estimated as same day as jointing)

IYRPI = 2003 ! Year of panicle initiation

IDOYFL = 232 ! Day of flowering

IYRFL = 2003 ! Year of flowering

IDOYM = 277 ! Day of maturity (estimated as 7 d before harvest)

IYRM = 2003 ! Year of maturity

\*DSSAT: FILEA IDAT = 03205

\* FILEA ADAT = 03232

\* FILEA MDAT = 03277

\*Leaf Area Index (m2 leaf / m2 ground):

LAI\_OBS =2003.,141.0,0.0,

2003.0,183.0,1.83,

2003.0,209.0,5.02,

2003.0,223.0,6.25,

2003.0,233.0,6.37,

2003.0,262.0,3.30,

2003.0,277.0,0.00

\*DSSAT: FILET LAID

\*-- Parameter to set forcing of observed LAI during simulation

LAI\_FRC = 0 ! No forcing

\*LAI\_FRC = 2 ! Forcing

\*Green leaf dry wt (kg/ha)

WLVG\_OBS =2003.0,141.0,0.0,

2003.0,183.0,646.27,

2003.0,209.0,2502.89,

2003.0,223.0,3297.57,

2003.0,233.0,3756.28,

2003.0,262.0,2213.33,

2003.0,277.0,0.00

\*DSSAT: FILET LWAD

\*Dead leaf dry wt (kg/ha)

WLVD\_OBS =2003.0,141.0,0.0,

2003.0,183.0,10.48,

2003.0,209.0,150.93,

2003.0,223.0,244.51,

2003.0,233.0,351.15,

2003.0,262.0,2033.68,

2003.0,277.0,2656.17

\*DSSAT: FILET LDAD

\*Stem dry wt (kg/ha)

WST\_OBS =2003.0,141.0,0.0,

2003.0,183.0,646.27,

2003.0,209.0,2301.65,

2003.0,223.0,5406.22,

2003.0,233.0,5267.31,

2003.0,262.0,5122.60,

2003.0,277.0,5524.83

\*DSSAT: FILET SWAD

\*Panicle dry wt (kg/ha)

WSO\_OBS = 2003.0,141.0,0.0,

2003.0,183.0,0.0,

2003.0,209.0,49.45,

2003.0,223.0,1536.93,

2003.0,233.0,2707.28,

2003.0,262.0,5983.60,

2003.0,277.0,7619.48

\*DSSAT: FILET PWAD

\*WAGT dry weight (kg/ha)

WAGT\_OBS =2003.0,141.0,0.0,

2003.0,183.0,1303.02,

2003.0,209.0,5004.92,

2003.0,223.0,10485.23,

2003.0,233.0,12082.02,

\*262.0,10948.04,

2003.0,262.0,15353.21,

2003.0,277.0,15800.48

\*DSSAT: FILET CWAD

\*-- Parameter to set forcing of observed NFLV values during simulation

\*NFLV\_FRC = 0 ! No forcing

\*NFLV\_FRC = 2 ! Forcing

\*---------------------------------------------------------------------------

\*Additional input for night temperature control experiment, if you have temperature control

\*---------------------------------------------------------------------------

ISTEMC = 0 !WHETHER USE TEMPERATURE CONTROL 0 = NO,

\* !1= NIGHT CONTROL, 2=DAY CONTROL

SHOUR = 19. !STARTING TIME FOR TEMPERATURE CONTROL

EHOUR = 5. !ENDING TIME FOR TEMPERATUREL CONTROL

SDAY = 77.

EDAY = 105.

TTEMP = 22. !TARGET TEMPERATURE, -999 MEANS NET CHANGE IS USED

TCHANG = -999. !NET CHANGE OF TEMPERATURE, -999 MEANS TARGET TEMPERATURE IS USED

CONTRM = 1 !1 = CONTROL LOWEST TEMPERATURE, 2 = CONSTANT TEMPERATURE

**HD297\_A11.EXP**

\*--------------------------------------------------------------------\*

\* EXPERIMENTAL DATA FILE \*

\* For SCENARIO ANALYSIS

\* \*

\* File name : HD297exp.DAT \*

\* Crop : Oryza sativa cv. Han Dao 297 \*

\* Fertilizer : 225 kg N/ha,

\* Irrigation : Full irrigation throughout growth period \*

\*--------------------------------------------------------------------\*

\*--------------------------------------------------------------------\*

\* 1. Selection of modes of running \*

\*--------------------------------------------------------------------\*

\*-- RICETYPE is to select lowland rice or aerobic/upland rice

RICETYPE = 'LOWLAND' ! Lowland rice

\*RICETYPE = 'AEROBIC' ! Upland or aerobic rice

\*-- RUNMODE: mode of running ORYZA

RUNMODE = 'EXPERIMENT' ! ORYZA simulates particular experiment

\*RUNMODE ='EXPLORATION' ! ORYZA used for exploration

\*-- PRODENV = Production situation setting

\*PRODENV = 'POTENTIAL' ! Potential production

PRODENV = 'WATER BALANCE' ! Production may be water-limited

\*-- WATBAL is choice of Water Balance

\* needs only be given when PRODENV = 'WATER BALANCE'

WATBAL = 'PADDY' ! PADDY water balance (for lowland soils)

\*WATBAL = 'SAHEL' ! SAHEL water balance (for freely draining upland soils)

\*WATBAL = 'SAWAH' ! SAWAH water balance (for lowland or upland soils)

\*-- NITROENV = Nitrogen production situation setting

\*NITROENV = 'POTENTIAL' ! Potential production

NITROENV = 'NITROGEN BALANCE' ! Production may be nitrogen-limited

\*-- ETMOD is method for evapotranspiration calculation:

ETMOD = 'PENMAN' ! Penman-based (Van Kraalingen & Stol,1996)

\*ETMOD = 'PRIESTLY TAYLOR' ! Priestly-Taylor (")

\*ETMOD = 'MAKKINK' ! Makkink (Van Kraalingen & Stol, 1996)

\*--------------------------------------------------------------------\*

\* 2. Timer data for simulation \*

\*--------------------------------------------------------------------\*

IYEAR = 2003 ! Start year of simulation (year)

STTIME = 134. ! Start time (day number)

FINTIM = 1000. ! Finish time (days after start)

DELT = 1. ! Time step (day)

\*--------------------------------------------------------------------\*

\* 3. Weather station and climatic data for simulation \*

\*--------------------------------------------------------------------\*

WTRDIR = 'D:\Projects\VirtualCrop\RunExamples\China\_Aerobic\' ! Directory of weather data

CNTR = 'CHINA' ! Country code

ISTN = 3 ! Station code

ANGA = 0.29 ! Angstrom A parameter

ANGB = 0.45 ! Angstrom B parameter

TMCTB = 0., 0., ! Table for temperature increase

366., 0. ! Climatic Change studies

FAOF = 1. ! Multipl. factor for pot. evapotranspiration (FAO)

! Value Murty & Tuong

TMPSB = 0. ! Temperature increase in seed-bed due to cover:

! Zero when no cover over seed-bed; 9.5 with seed-bed

\*--------------------------------------------------------------------\*

\* 4. Establishment data

\*--------------------------------------------------------------------\*

\*-- ESTAB is method of establishment: 'TRANSPLANT' or 'DIRECT-SEED'

\*ESTAB='TRANSPLANT'

ESTAB='DIRECT-SEED'

\* Aerobic rice: sowing date 16 May; 50% emergence 24 May

EMD = 140 ! Day of emergence (either direct, or in seed-bed)

EMYR = 2003 ! Year of emergence

SBDUR = 19 ! Seed-bed duration (days between sowing and transplanting)

Direct seed date: May 16 (DOY 136)

EMD = May 20 (DOY 140)

50% emergence = May 24 (DOY 144)

\*DSSAT: PDATE = 03140 !this is the start date for ORYZA simulation

EDATE = 03144

\*--------------------------------------------------------------------\*

\* 5. Management parameters \*

\*--------------------------------------------------------------------\*

\* rows 30 cm seeding rate: 150 kg/ha (0.02 g per grain)

NPLH = 1. ! Number of plants per hill

NH = 1. ! Number of hills/m2 (13 x 27 cm)

NPLSB = 350. ! Number of plants in seed-bed (???)

NPLDS = 490. ! Number of plants/m2 direct-seeded, according to wheat

! 120kg/ha should be smaller than 210!!!

\*-- Initial data at emergence, for either direct-seeding or seed-bed

\* Standard data used.

LAPE = 0.00005 ! Initial leaf area per plant (m2 plant-1) (according to wheat)

\*LAPE = 0.0001

DVSI = 0.0 ! Initial development stage

WLVGI = 0.0 ! Initial leaf weight

WSTI = 0.0 ! Initial stem weight

WRTI = 0.0 ! Initial stem weight

WSOI = 0.0 ! Initial weight storage organs

ZRTI = 0.0001 ! Initial root depth (m)

\*-- Re-initialization at transplanting (standard data used)

ZRTTR = 0.05 ! Root depth at transplanting (m)

\*---------------------------------------------------------------\*

\* 6. Irrigation switch:

\* Need only to be filled-in when PRODENV = 'WATER BALANCE'

\*---------------------------------------------------------------\*

DVSIMAX = 2.0 ! Development stage after which no more irrigation is applied

\* NEW SETTING, BY TAOLI, 21 MAY 2010

\* The determination for switch critical

ICOMBA = 2 !1: Use Julian day; 2: Use DVS and 3: Use mixture of DVS and Julian day,

\* but the Julian day is not allowed to be smaller than 2

\* Combining irrigation management methods table IRMTAB, it must have at least two lines,

\* X (Julian day or DVS or DVS+Julian, present the switching day), Y (methods in real number)

IRMTAB = 0.,1.0,

2.0,1.0

\*\* Select from the following options:

\*SWITIR = 0 ! No irrigation; rainfed

\*SWITIR = 1 ! Irrigation supplied as input data

\*SWITIR = 2 ! Irrigation at minimum standing soil water depth

\*SWITIR = 3 ! Irrigation at minimum soil water potential

\*SWITIR = 4 ! Irrigation at minimum soil water content

\*SWITIR = 5 ! Irrigation at X days after disapp. standing water

\*SWITIR = 6 ! Irrigation at minimum soil water potential in defined periods only

\*\* If SWITIR = 1, supply irrigation table, amount of irrigation

\*\* (y in mm) for a given calendar \* day (x), used if

RIRRIT = 1., 0.,

170., 0.,

171., 40.,

172., 0.,

184., 0.,

185., 60.,

186., 0.,

199., 0.,

200., 20.,

201., 0.,

228., 0.,

229., 40.,

230., 0.,

253., 0.,

254., 60.,

255., 0.,

365., 0.

\*\* If SWITIR = 2, supply amount of irrigation IRRI (mm)

IRRI2 = 50. ! Irrigation gift (mm)

WL0MIN = 10. ! Minimum standing water depth (mm)

\*\* IF SWITIR =3:

\*\*\*1) supply amount of irrigation IRRI3 (mm)

\*\*\*2) supply minimum soil water potential KPAMIN (KPa)

\*\*\*3) Supply soil layer for which KPAMIN aplied, SLMIN3

IRRI3 = 50. !IT MUST BE REAL DATA

KPAMIN = 10. !IT MUST BE REAL DATA

SLMIN3 = 2 !IT MUST BE INTEGER DATA

\*\* IF SWITIR = 4:

\*\*\*1) supply amount of irrigation IRRI4 (mm)

\*\*\*2) supply minimum soil water conten WCAMIN (-)

\*\*\*3) Supply soil layer for which KPAMIN aplied, SLMIN4

IRRI4 = 75. !IT MUST BE REAL DATA

WCMIN = 0.3662 !IT MUST BE REAL DATA

SLMIN4 =2 !IT MUST BE INTEGER DATA

\*\* IF SWITIR = 5:

\*\*\*1) supply amount of irrigation IRRI5 (mm)

\*\*\*2) supply number of days after disappearence of standing water (WL0DAY) at which irrigation water is applied

IRRI5 = 75. !IT MUST BE REAL DATA

WL0DAY = 5 ! number of days after disappearence of (-) INTEGER!!

\* IF SWITIR = 6:

\*\*\*1) supply amount of irrigation IRRI6 (mm)

\*\*\*2) Supply soil layer for which KPAMIN aplied, SLMIN6

\*\*\*3) period table as "start DVS' 'finish DVS' 'KPAMIN during period'

\* Irrigation will be applied in the periods between 'start DVs' to 'end DVS'

\* and only when the soil water tension in layer SLMIN is above KPAMIN in that period

\* Note: at maximum 5 stages can de defined (no more than 15 data in table)!

IRRI6 = 50. !IT MUST BE REAL DATA

SLMIN6 = 3 !IT MUST BE INTEGER DATA

ISTAGET = 0.00, 0.20, 5.,

0.65, 0.80, 50.,

1.00, 1.20, 5.,

1.50, 1.60, 50.,

1.70, 1.80, 5.

\*--------------------------------------------------------------------\*

\* 7. Nitrogen parameters \*

\*--------------------------------------------------------------------\*

NUTRIENT = 'GENERAL SOM' !USE GENERAL SOIL ORGANIC C AND N MODULE TO HANDLE THE NUTRIENT CHANGES

\*NUTRIENT = 'APSIM SOILN' !USE APSIM SOIL C AND N MODULE TO HANDLE THE NUTRIENT CHANGES, IT CONSISTED

!BY SOILN, POND AND SURFACEOM MODULES

\* Table of recovery fraction of Nitrogen in the soil (-) second column

\* versus development stage (DVS) (first column) STANDARD VALUE

RECNIT =

0.0, 0.30,

0.2, 0.35,

0.4, 0.50,

0.8, 0.75,

1.0, 0.75,

2.5, 0.75

\* NO DATA ON SOILSP: THIS 0.8 IS FOR IRRI CONDITIONS IN THE DS......

SOILSP = 0.8 ! Soil N mineralization rate (kg N/ha/d)

\* Table of fertilizer rate (kg N/ha) (second column) versus days after emergence

\* in the seed-bed (!) (first column)

FERTIL = 0.0,75.0,

57.0,105.0,

77.0,45.0

\*--------------------------------------------------------------------\*

\* 8. Measured data for model calibration and comparison \*

\* And option to force measured LAI during simulation \*

\* (instead of using simulated values) \*

\*--------------------------------------------------------------------\*

\* Observed phenology: only required if program DRATES is run!!

\* Observed phenology: only required if program DRATES is run!!

IDOYTR = 0 ! Day of transplanting (give 0 if direct-seeded)

IYRTR = 0 ! Year of transplanting (give 0 if direct-seeded)

IDOYPI = 200 ! Day of panicle initiation (estimated as same day as jointing)

IYRPI = 2003 ! Year of panicle initiation

IDOYFL = 231 ! Day of flowering

IYRFL = 2003 ! Year of flowering

IDOYM = 275 ! Day of maturity (estimated as 7 d before harvest)

IYRM = 2003 ! Year of maturity

\*Leaf Area Index (m2 leaf / m2 ground):

LAI\_OBS =2003.,140.0,0.0,

2003.0,183.0,2.08,

2003.0,209.0,5.59,

2003.0,223.0,6.58,

2003.0,233.0,6.20,

2003.0,262.0,3.06,

2003.0,275.0,0.00

\*-- Parameter to set forcing of observed LAI during simulation

LAI\_FRC = 0 ! No forcing

\*LAI\_FRC = 2 ! Forcing

\*Green leaf dry wt (kg/ha)

WLVG\_OBS =2003.0,140.0,0.0,

2003.0,183.0,655.00,

2003.0,209.0,2643.24,

2003.0,223.0,2673.80,

2003.0,233.0,3098.33,

2003.0,262.0,2281.19,

2003.0,275.0,0.00

\*Dead leaf dry wt (kg/ha)

WLVD\_OBS =2003.0,140.0,0.0,

2003.0,183.0,45.49,

2003.0,209.0,226.94,

2003.0,223.0,472.94,

2003.0,233.0,669.60,

2003.0,262.0,1055.48,

2003.0,275.0,3077.48

\*Stem dry wt (kg/ha)

WST\_OBS =2003.0,140.0,0.0,

2003.0,183.0,700.49,

2003.0,209.0,2483.04,

2003.0,223.0,3023.85,

2003.0,233.0,4698.57,

2003.0,262.0,5413.57,

2003.0,275.0,6493.48

\*Panicle dry wt (kg/ha)

WSO\_OBS = 2003.0,140.0,0.0,

2003.0,183.0,0.00,

2003.0,209.0,0.00,

2003.0,223.0,1554.39,

2003.0,233.0,2724.63,

2003.0,262.0,6148.7,

2003.0,275.0,6752.09

\*WAGT dry weight (kg/ha)

WAGT\_OBS =2003.0,140.0,0.0,

2003.0,183.0,1400.97,

2003.0,209.0,5353.22,

2003.0,223.0,7724.99,

2003.0,233.0,11191.14,

2003.0,262.0,12898.94,

2003.0,275.0,13932.19

\*-- Parameter to set forcing of observed NFLV values during simulation

\*NFLV\_FRC = 0 ! No forcing

\*NFLV\_FRC = 2 ! Forcing

\*---------------------------------------------------------------------------

\*Additional input for night temperature control experiment, if you have temperature control

\*---------------------------------------------------------------------------

ISTEMC = 0 !WHETHER USE TEMPERATURE CONTROL 0 = NO,

\* !1= NIGHT CONTROL, 2=DAY CONTROL

SHOUR = 19. !STARTING TIME FOR TEMPERATURE CONTROL

EHOUR = 5. !ENDING TIME FOR TEMPERATUREL CONTROL

SDAY = 77.

EDAY = 105.

TTEMP = 22. !TARGET TEMPERATURE, -999 MEANS NET CHANGE IS USED

TCHANG = -999. !NET CHANGE OF TEMPERATURE, -999 MEANS TARGET TEMPERATURE IS USED

CONTRM = 1 !1 = CONTROL LOWEST TEMPERATURE, 2 = CONSTANT TEMPERATURE

**HD297\_A22.EXP**

\*--------------------------------------------------------------------\*

\* EXPERIMENTAL DATA FILE \*

\* For SCENARIO ANALYSIS

\* \*

\* File name : HD297exp.DAT \*

\* Crop : Oryza sativa cv. Han Dao 297 \*

\* Fertilizer : 225 kg N/ha,

\* Irrigation : Full irrigation throughout growth period \*

\*--------------------------------------------------------------------\*

\*--------------------------------------------------------------------\*

\* 1. Selection of modes of running \*

\*--------------------------------------------------------------------\*

\*-- RICETYPE is to select lowland rice or aerobic/upland rice

RICETYPE = 'LOWLAND' ! Lowland rice

\*RICETYPE = 'AEROBIC' ! Upland or aerobic rice

\*-- RUNMODE: mode of running ORYZA

RUNMODE = 'EXPERIMENT' ! ORYZA simulates particular experiment

\*RUNMODE ='EXPLORATION' ! ORYZA used for exploration

\*-- PRODENV = Production situation setting

\*PRODENV = 'POTENTIAL' ! Potential production

PRODENV = 'WATER BALANCE' ! Production may be water-limited

\*-- WATBAL is choice of Water Balance

\* needs only be given when PRODENV = 'WATER BALANCE'

WATBAL = 'PADDY' ! PADDY water balance (for lowland soils)

\*WATBAL = 'SAHEL' ! SAHEL water balance (for freely draining upland soils)

\*WATBAL = 'SAWAH' ! SAWAH water balance (for lowland or upland soils)

\*-- NITROENV = Nitrogen production situation setting

\*NITROENV = 'POTENTIAL' ! Potential production

NITROENV = 'NITROGEN BALANCE' ! Production may be nitrogen-limited

\*-- ETMOD is method for evapotranspiration calculation:

ETMOD = 'PENMAN' ! Penman-based (Van Kraalingen & Stol,1996)

\*ETMOD = 'PRIESTLY TAYLOR' ! Priestly-Taylor (")

\*ETMOD = 'MAKKINK' ! Makkink (Van Kraalingen & Stol, 1996)

\*--------------------------------------------------------------------\*

\* 2. Timer data for simulation \*

\*--------------------------------------------------------------------\*

IYEAR = 2003 ! Start year of simulation (year)

STTIME = 134. ! Start time (day number)

FINTIM = 1000. ! Finish time (days after start)

DELT = 1. ! Time step (day)

\*--------------------------------------------------------------------\*

\* 3. Weather station and climatic data for simulation \*

\*--------------------------------------------------------------------\*

WTRDIR = 'D:\Projects\VirtualCrop\RunExamples\China\_Aerobic\' ! Directory of weather data

CNTR = 'CHINA' ! Country code

ISTN = 3 ! Station code

ANGA = 0.29 ! Angstrom A parameter

ANGB = 0.45 ! Angstrom B parameter

TMCTB = 0., 0., ! Table for temperature increase

366., 0. ! Climatic Change studies

FAOF = 1. ! Multipl. factor for pot. evapotranspiration (FAO)

! Value Murty & Tuong

TMPSB = 0. ! Temperature increase in seed-bed due to cover:

! Zero when no cover over seed-bed; 9.5 with seed-bed

\*--------------------------------------------------------------------\*

\* 4. Establishment data

\*--------------------------------------------------------------------\*

\*-- ESTAB is method of establishment: 'TRANSPLANT' or 'DIRECT-SEED'

\*ESTAB='TRANSPLANT'

ESTAB='DIRECT-SEED'

\* Aerobic rice: sowing date 16 May; 50% emergence 24 May

EMD = 140 ! Day of emergence (either direct, or in seed-bed)

EMYR = 2003 ! Year of emergence

SBDUR = 19 ! Seed-bed duration (days between sowing and transplanting)

\*--------------------------------------------------------------------\*

\* 5. Management parameters \*

\*--------------------------------------------------------------------\*

\* rows 30 cm seeding rate: 150 kg/ha (0.02 g per grain)

NPLH = 1. ! Number of plants per hill

NH = 1. ! Number of hills/m2 (13 x 27 cm)

NPLSB = 350. ! Number of plants in seed-bed (???)

NPLDS = 490. ! Number of plants/m2 direct-seeded, according to wheat

! 120kg/ha should be smaller than 210!!!

\*-- Initial data at emergence, for either direct-seeding or seed-bed

\* Standard data used.

LAPE = 0.00005 ! Initial leaf area per plant (m2 plant-1) (according to wheat)

\*LAPE = 0.0001

DVSI = 0.0 ! Initial development stage

WLVGI = 0.0 ! Initial leaf weight

WSTI = 0.0 ! Initial stem weight

WRTI = 0.0 ! Initial stem weight

WSOI = 0.0 ! Initial weight storage organs

ZRTI = 0.0001 ! Initial root depth (m)

\*-- Re-initialization at transplanting (standard data used)

ZRTTR = 0.05 ! Root depth at transplanting (m)

\*---------------------------------------------------------------\*

\* 6. Irrigation switch:

\* Need only to be filled-in when PRODENV = 'WATER BALANCE'

\*---------------------------------------------------------------\*

DVSIMAX = 2.0 ! Development stage after which no more irrigation is applied

\* NEW SETTING, BY TAOLI, 21 MAY 2010

\* The determination for switch critical

ICOMBA = 2 !1: Use Julian day; 2: Use DVS and 3: Use mixture of DVS and Julian day,

\* but the Julian day is not allowed to be smaller than 2

\* Combining irrigation management methods table IRMTAB, it must have at least two lines,

\* X (Julian day or DVS or DVS+Julian, present the switching day), Y (methods in real number)

IRMTAB = 0.,1.0,

2.0,1.0

\*\* Select from the following options:

\*SWITIR = 0 ! No irrigation; rainfed

\*SWITIR = 1 ! Irrigation supplied as input data

\*SWITIR = 2 ! Irrigation at minimum standing soil water depth

\*SWITIR = 3 ! Irrigation at minimum soil water potential

\*SWITIR = 4 ! Irrigation at minimum soil water content

\*SWITIR = 5 ! Irrigation at X days after disapp. standing water

\*SWITIR = 6 ! Irrigation at minimum soil water potential in defined periods only

\*\* If SWITIR = 1, supply irrigation table, amount of irrigation

\*\* (y in mm) for a given calendar \* day (x), used if

RIRRIT = 1., 0.,

170., 0.,

171., 40.,

172., 0.,

184., 0.,

185., 60.,

186., 0.,

199., 0.,

200., 20.,

201., 0.,

228., 0.,

229., 40.,

230., 0.,

253., 0.,

254., 60.,

255., 0.,

365., 0.

\*\* If SWITIR = 2, supply amount of irrigation IRRI (mm)

IRRI2 = 50. ! Irrigation gift (mm)

WL0MIN = 10. ! Minimum standing water depth (mm)

\*\* IF SWITIR =3:

\*\*\*1) supply amount of irrigation IRRI3 (mm)

\*\*\*2) supply minimum soil water potential KPAMIN (KPa)

\*\*\*3) Supply soil layer for which KPAMIN aplied, SLMIN3

IRRI3 = 50. !IT MUST BE REAL DATA

KPAMIN = 10. !IT MUST BE REAL DATA

SLMIN3 = 2 !IT MUST BE INTEGER DATA

\*\* IF SWITIR = 4:

\*\*\*1) supply amount of irrigation IRRI4 (mm)

\*\*\*2) supply minimum soil water conten WCAMIN (-)

\*\*\*3) Supply soil layer for which KPAMIN aplied, SLMIN4

IRRI4 = 75. !IT MUST BE REAL DATA

WCMIN = 0.3662 !IT MUST BE REAL DATA

SLMIN4 =2 !IT MUST BE INTEGER DATA

\*\* IF SWITIR = 5:

\*\*\*1) supply amount of irrigation IRRI5 (mm)

\*\*\*2) supply number of days after disappearence of standing water (WL0DAY) at which irrigation water is applied

IRRI5 = 75. !IT MUST BE REAL DATA

WL0DAY = 5 ! number of days after disappearence of (-) INTEGER!!

\* IF SWITIR = 6:

\*\*\*1) supply amount of irrigation IRRI6 (mm)

\*\*\*2) Supply soil layer for which KPAMIN aplied, SLMIN6

\*\*\*3) period table as "start DVS' 'finish DVS' 'KPAMIN during period'

\* Irrigation will be applied in the periods between 'start DVs' to 'end DVS'

\* and only when the soil water tension in layer SLMIN is above KPAMIN in that period

\* Note: at maximum 5 stages can de defined (no more than 15 data in table)!

IRRI6 = 50. !IT MUST BE REAL DATA

SLMIN6 = 3 !IT MUST BE INTEGER DATA

ISTAGET = 0.00, 0.20, 5.,

0.65, 0.80, 50.,

1.00, 1.20, 5.,

1.50, 1.60, 50.,

1.70, 1.80, 5.

\*--------------------------------------------------------------------\*

\* 7. Nitrogen parameters \*

\*--------------------------------------------------------------------\*

NUTRIENT = 'GENERAL SOM' !USE GENERAL SOIL ORGANIC C AND N MODULE TO HANDLE THE NUTRIENT CHANGES

\*NUTRIENT = 'APSIM SOILN' !USE APSIM SOIL C AND N MODULE TO HANDLE THE NUTRIENT CHANGES, IT CONSISTED

!BY SOILN, POND AND SURFACEOM MODULES

\* Table of recovery fraction of Nitrogen in the soil (-) second column

\* versus development stage (DVS) (first column) STANDARD VALUE

RECNIT =

0.0, 0.30,

0.2, 0.35,

0.4, 0.50,

0.8, 0.75,

1.0, 0.75,

2.5, 0.75

\* NO DATA ON SOILSP: THIS 0.8 IS FOR IRRI CONDITIONS IN THE DS......

SOILSP = 0.8 ! Soil N mineralization rate (kg N/ha/d)

\* Table of fertilizer rate (kg N/ha) (second column) versus days after emergence

\* in the seed-bed (!) (first column)

FERTIL = 0.0,75.0,

57.0,105.0,

77.0,45.0

\*--------------------------------------------------------------------\*

\* 8. Measured data for model calibration and comparison \*

\* And option to force measured LAI during simulation \*

\* (instead of using simulated values) \*

\*--------------------------------------------------------------------\*

\* Observed phenology: only required if program DRATES is run!!

\* Observed phenology: only required if program DRATES is run!!

IDOYTR = 0 ! Day of transplanting (give 0 if direct-seeded)

IYRTR = 0 ! Year of transplanting (give 0 if direct-seeded)

IDOYPI = 200 ! Day of panicle initiation (estimated as same day as jointing)

IYRPI = 2003 ! Year of panicle initiation

IDOYFL = 231 ! Day of flowering

IYRFL = 2003 ! Year of flowering

IDOYM = 275 ! Day of maturity (estimated as 7 d before harvest)

IYRM = 2003 ! Year of maturity

\*Leaf Area Index (m2 leaf / m2 ground):

LAI\_OBS =2003.,140.0,0.0,

2003.0,183.0,2.08,

2003.0,209.0,5.59,

2003.0,223.0,6.58,

2003.0,233.0,6.20,

2003.0,262.0,3.06,

2003.0,275.0,0.00

\*-- Parameter to set forcing of observed LAI during simulation

LAI\_FRC = 0 ! No forcing

\*LAI\_FRC = 2 ! Forcing

\*Green leaf dry wt (kg/ha)

WLVG\_OBS =2003.0,140.0,0.0,

2003.0,183.0,655.00,

2003.0,209.0,2643.24,

2003.0,223.0,2673.80,

2003.0,233.0,3098.33,

2003.0,262.0,2281.19,

2003.0,275.0,0.00

\*Dead leaf dry wt (kg/ha)

WLVD\_OBS =2003.0,140.0,0.0,

2003.0,183.0,45.49,

2003.0,209.0,226.94,

2003.0,223.0,472.94,

2003.0,233.0,669.60,

2003.0,262.0,1055.48,

2003.0,275.0,3077.48

\*Stem dry wt (kg/ha)

WST\_OBS =2003.0,140.0,0.0,

2003.0,183.0,700.49,

2003.0,209.0,2483.04,

2003.0,223.0,3023.85,

2003.0,233.0,4698.57,

2003.0,262.0,5413.57,

2003.0,275.0,6493.48

\*Panicle dry wt (kg/ha)

WSO\_OBS = 2003.0,140.0,0.0,

2003.0,183.0,0.00,

2003.0,209.0,0.00,

2003.0,223.0,1554.39,

2003.0,233.0,2724.63,

2003.0,262.0,6148.7,

2003.0,275.0,6752.09

\*WAGT dry weight (kg/ha)

WAGT\_OBS =2003.0,140.0,0.0,

2003.0,183.0,1400.97,

2003.0,209.0,5353.22,

2003.0,223.0,7724.99,

2003.0,233.0,11191.14,

2003.0,262.0,12898.94,

2003.0,275.0,13932.19

\*-- Parameter to set forcing of observed NFLV values during simulation

\*NFLV\_FRC = 0 ! No forcing

\*NFLV\_FRC = 2 ! Forcing

\*---------------------------------------------------------------------------

\*Additional input for night temperature control experiment, if you have temperature control

\*---------------------------------------------------------------------------

ISTEMC = 0 !WHETHER USE TEMPERATURE CONTROL 0 = NO,

\* !1= NIGHT CONTROL, 2=DAY CONTROL

SHOUR = 19. !STARTING TIME FOR TEMPERATURE CONTROL

EHOUR = 5. !ENDING TIME FOR TEMPERATUREL CONTROL

SDAY = 77.

EDAY = 105.

TTEMP = 22. !TARGET TEMPERATURE, -999 MEANS NET CHANGE IS USED

TCHANG = -999. !NET CHANGE OF TEMPERATURE, -999 MEANS TARGET TEMPERATURE IS USED

CONTRM = 1 !1 = CONTROL LOWEST TEMPERATURE, 2 = CONSTANT TEMPERATURE